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Towards a Responsible Innovation Agenda for HCI.

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KEYWORDS

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ABSTRACT

In recent years responsible innovation has gained significant traction and can be seen to adorn a myriad of research platforms, education programs, and policy frameworks. In this workshop, we invite HCI researchers to discuss the relations between the CHI community and responsible innovation. This workshop looks to build provocations and principles for and with HCI researchers who are or wish to become responsible innovators. The workshop looks to do this by asking attendees to think about the social, environmental, and economic impacts of ICT and HCI and explore how research innovation frameworks speak to responsible HCI innovation. Through the workshop we look to examine 5 questions to develop a set of provocations and principles, which will help encourage HCI and computer science researchers, educators, and innovators to reflect on the impact of their research and innovation.

BACKGROUND

Over the last few decades, the innovations that digital technology has provided have radically transformed societies throughout the world. Innovations in interaction design have played key roles in making this happen, and the field continues to grow and have impact. While many would argue that much good comes from this process, there is increasing recognition of the risks and downsides of innovation [15, 18]. Recent criticisms of digital innovation have included:

- Growth in Greenhouse Gas (GHG) emissions associated with the ubiquitous use of technology;
- Precarious nature of employment conditions associated with digitally enabled business models;
- Interference in political systems and societal destabilisation by state actors through social media.

In recent years responsible innovation (RI) has gained significant traction and can be seen to adorn myriad research platforms, education programs, and policy frameworks [21, 26, 27]. Defined as “taking care of the future through collective stewardship of science and innovation in the present” [21], RI is often perceived as a corrective, a means to add a valuative dimension to the practices associated with technological development and progress. However, innovation is vulnerable to being viewed as synonymous with pursuing newness at all costs, as production for its own sake without reflecting on the wider consequences. RI mitigates this by opening the field up to social and environmental concerns, demands for accountability and transparency, a longer term perspective on potential consequences,

and wider public participation in processes of technological development [20]. Jirotko et al. [17] argue that “responsible research and innovation aims to ensure that the processes and outcomes of research are aligned with societal values.” In this sense, RI functions both as a rhetorical trope, and as a container for everyday research and design activities, providing an interesting opportunity to examine the relations between design, ethics, and the future.

Seen this way, RI may benefit all innovators; it is an alternative lens that can be used to increase the positive impact of technological solutions and reduce the risk of unintended consequences challenging the success of the innovation in the future. As a field that focuses on understanding where humans and digital technology meet, Human-Computer Interaction (HCI) is well placed to contribute to the broader, emerging discussions around RI. While research has already identified some lessons that HCI and RI can offer each other [16], this workshop aims to continue and further broaden this conversation.

Strands within HCI have already encouraged a widening of the scope considered in interaction design, into areas relevant to the RI agenda. The importance of integrating values from many stakeholders into the design process has been advocated by proponents of value-sensitive design [10, 14]. Sustainable HCI (SHCI), and Sustainable Interaction Design [5], in particular, aim to embed notions of environmental responsibility in the design process. Furthermore, others have advocated the need to broaden the scope beyond the individual [9], to consider the political and cultural context of innovations which HCI has traditionally obscured [8, 12], and explicitly integrate considerations of environmental and social justice [3, 13]. It has been argued that when designing to engage with the systematic or “wicked” problems society faces, considerations of injustice, inequality and discrimination are essential [11]. As a result, we ask to what extent do existing RI frameworks account for these? And, what areas do they open that have not yet been investigated by the HCI community?

HCI research often explores innovative opportunities to address social, environmental and economic problems while considering issues of responsibility in its analysis. For example, the impact of technology innovations and economic pressures on parcel couriers [2]. However, the responsibility aspects and criteria of such research are difficult to evaluate, in part due to the way evaluation and validation in HCI typically focus on aspects of technology design, UX and usability, leaving more complex and wicked problems as a secondary concern [24]. Another question then is: can RI frameworks help us suggest, evaluate, and validate more complex notions of responsibility in HCI?

Inversely, HCI may offer a number of tools and methods that can support the responsible innovation agenda. Methods such as design fiction or speculative design show potential to create provocation and reflection [19]. Design fiction has already been used successfully in addressing sustainability issues and designing for empowerment [22]. Some design fictions, by considering radical change over a short period of time, can open up a dialogue on future trajectories and reflection on present conditions. They can also build new narratives to critique existing practices [1], understandings [6],

and question the solutionism [7] often associated with HCI. The use of speculative ‘what if’ future scenarios has been used to connect work in HCI to possibilities for change and disruption in the present. Here, we ask: how can these, and other tools developed by the HCI community, be used to support responsible innovation in the digital society?

HCI also offers a number of critical, values-led perspectives which have challenged mainstream solutionist attitudes on innovation and responsibility. These argue the need to break away from existing stabilized practices [23] comprised of cultural norms, values and socio-technical structures which can inhibit significant change [25]. Subsequently, we ask: to what extent can the more mainstream RI agenda respond to this challenge, and to what extent may it ignore or co-opt it? This workshop seeks contributions that address the relations between RI and the theories and practices of HCI. We encourage a diversity of contributions - both those which aim to integrate HCI and RI, and those which aim to use concepts from HCI to critique or problematize RI, and vice versa

ORGANISERS

Oliver Bates is a Senior Research Associate at Lancaster University focusing on the intersection between social justice, energy consumption, and technology in the freight and logistics sectors. He is the co-chair of the SIGCHI Community for HCI and Sustainability and organised SIGs at CHI (2018) alongside workshops relating to sustainability and futures.

Kathy New is a PhD candidate at Lancaster University funded by the Centre of Global Eco-Innovation with a long history of working for Third Sector Organisations.

Samantha Mitchell-Finnigan is a PhD candidate at Open Lab, Newcastle University working at the nexus of SHCI and buildings management. She is also part of the feminist technology collective fempower.tech.

Matthew Louis Mauriello is a Postdoctoral Scholar at Stanford University through a joint position with Oregon State University, developing family- and youth-based behavioral interventions to promote energy efficiency using smart meter data and activity tracking.

Christian Remy is an Assistant Professor at Aarhus University in Denmark, developing creativity support tools and investigating their impact on social and environmental sustainability.

Roy Bendor is Assistant Professor in the Department of Industrial Design at Delft University of Technology, the Netherlands, and author of *Interactive Media for Sustainability* (Palgrave, 2018) [4].

Samuel Mann is Professor of Leadership for Change at Otago Polytechnic, currently working on transformation mindsets for socio-ecological regeneration.

Simran Chopra is a PhD candidate at Nor.sc Lab, Northumbria University. Her research intersects: SHCI, visioning, food, and community action.

Adrian Clear is a Senior Research Fellow in Digital Living at Nor.sc Lab, Northumbria University. He works on HCI design for transitioning to more sustainable ways of living.

Chris Preist is Professor of Sustainability and Computer Systems at the University of Bristol in the UK, working on the integration of environmental impacts into the design of digital services.

WEBSITE

The workshop website is hosted at <http://wp.lancs.ac.uk/hci-responsible-innovation>. The link will be circulated along with the call for participation. The website will contain information about the workshop, the workshop plans, the interactive spaces for discussion (pre- and post-workshop) as well as the call for participation. All accepted abstracts will be made available to the participants prior to the workshop. Additionally, the website will link to existing RI frameworks and principles, existing resources and networks in HCI, and the final outputs from the workshop including new guidelines and opportunities for RI thus becoming a living resource on RI and HCI.

PRE-WORKSHOP PLANS

The Call for Participation will be circulated via: relevant mailing lists (e.g., chi-announce, sustainable-chi, departmental lists); communities (e.g., fempower.tech, HCI and Sustainability, HCID, SIG Computing and Society); social media (e.g., Twitter, facebook); and, via the workshop website. We will also use the organizers' professional networks to directly notify colleagues and students who may be interested in taking part.

We will invite submissions of 1-4 page abstracts (including references), which may take the format of extended abstracts, pictorials, sketches, or any medium that the author sees fit. Abstract topics may include but are not limited to the following topics:

- Accounts of real world "Responsible Innovation" contexts, statements, and promises.
- Discussions of the impact of disruptive technologies with profound impacts.
- Examples of paradoxes in RI.
- Descriptions of existing frameworks and principles that are used and promoted across research, education, and technology innovation communities.
- HCI technologies, tools and methods for evaluating and accounting for RI.
- Case studies of RI in HCI.
- Critiques and assessments of RI in HCI.
- Where does innovation end and responsibility begin?
- Opportunities for alternative notions of responsibility in RI.
- Making RI Visible

Each submission will receive (at least) two reviews from the workshop organisers. Those which are well argued, represent a broad range of perspectives, and provide insightful contributions to the

Beyond the workshop (and Glasgow)

Discussions of RI cross cuts topics, geographies, gender and we aim to open up participation in the discussion beyond just the workshop attendees. After the workshop the organisers will make the workshop papers, presentations and discussions available through online documentation, video streams, and a living document. The PechaKuchas presentations will be recorded and uploaded to the workshop website for dissemination along with any other outputs. Beyond the workshop the organisers aim to maintain a dialogue with the attendees through the SHCI Slack™ channel and develop collaborative projects with the use of Basecamp™ in order to produce a set of online resources for the HCI community together with a supporting ACM interactions article.

¹<https://en.wikipedia.org/wiki/PechaKucha>

²<https://www.pechakucha.org/>

³https://en.wikipedia.org/wiki/Open_Space_Technology

themes of the workshop will be selected. Based on interest following last year's CHI SIG on social justice [3], we expect approximately 15-20 participants to take part in the workshop.

WORKSHOP STRUCTURE

This is a one day workshop that will focus on collating perspectives, critiques, and frameworks of RI to develop a knowledge base for use by HCI researchers. Here, we describe a tentative outline of the workshop:

- 09:00-09:30 - Welcome, goals and agenda, guest speaker
- 09:30-10:30 - Round-table PechaKucha
- 10:30-11:00 - Coffee break
- 11:00-13:00 - Part 1 - Formulating the Challenges
- 13:00-14:00 - Outdoor lunch; weather permitting.
- 14:00-15:30 - Part 2 - Developing Shared Visions
- 15:30-17:00 - Provocation and Principle Summarising
- 19:00-21:00 - Informal meal for networking

Short PechaKucha¹², style talks (i.e., talks composed of approximately 9 images described in 20 seconds each) will be given by all accepted attendees to succinctly share positions and ideas. The Open Space³ meeting approach will be used during Part 1 and Part 2 of the workshop to encourage free dialog and bottom-up agenda setting. In the second half of the workshop, we will also encourage teams to coalesce around specific questions and produce short briefings in written or poster form.

As part of the workshop we are approaching guest speakers from UK Third Sector Organisations (e.g., NHS, MATTER [20]) to participate in the workshop and provide valuable context and input from their experiences in the area of RI.

CALL FOR PARTICIPATION

This workshop will bring together researchers to reflect on the challenges of Responsible Innovation (RI) in digital societies and collaboratively develop strategies for the HCI community to engage with, practice, contribute to, critique, and evaluate the RI agenda with particular reference to digital technology. The workshop will consist of short PechaKucha talks outlining participants positions, and several flexible Open Space workshops to explore and formulate positions surrounding the following questions:

- (1) What roles can HCI play in facilitating Responsible Innovation across computing education, practice, innovation and research?
- (2) What can RI learn from existing principles and frameworks in HCI?
- (3) How can we encourage, enforce and regulate RI?

- (4) How can we evaluate, critique and improve responsible innovation?
- (5) What paradoxes exist through green washing and pandering to RI? (e.g. Big Company X has a statement about RI whilst exploiting workforces and monopolising)
- (6) What tools and methods can help explore and account for responsible innovation?
- (7) Opportunities and guidelines for Responsible Innovation
- (8) How can RI be broadened and Expanded to consider the future

We aim to produce a collective statement and initiate collaborative working papers based on themes emerging from the workshop. We invite submissions of 1-4 page position statements (including references) relevant to the above themes. These may take the format of extended abstracts, pictorials, sketches, or any other medium that the author sees fit. Please direct submissions and queries to responsibleinnovationhci@gmail.com. Further information at: <http://wp.lancs.ac.uk/hci-responsible-innovation>. At least one author of each accepted abstract must attend the workshop. All participants must register for the workshop and at least one day of the ACM CHI 2019 conference.

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REFERENCES

- [1] James Auger. 2013. Speculative design: crafting the speculation. *Digital Creativity* 24, 1 (2013), 11–35.
- [2] Oliver Bates, Adrian Friday, Julian Allen, Tom Cherrett, Fraser McLeod, Tolga Bektas, ThuBa Nguyen, Maja Piecyk, Marzena Piotrowska, Sarah Wise, et al. 2018. Transforming last-mile logistics: Opportunities for more sustainable deliveries. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, 526.
- [3] Oliver Bates, Vanessa Thomas, Christian Remy, Adrian Friday, Lisa Nathan, Mike Hazas, and Samuel Mann. 2018. Championing environmental and social justice: embracing, embedding, and promoting broader notions of sustainability in HCI. *Interactions* 25, 5 (2018), 60–67.
- [4] Roy Bendor. 2018. Interactive Media for Sustainability.
- [5] Eli Blevis. 2007. Sustainable interaction design: invention & disposal, renewal & reuse. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. ACM, 503–512.
- [6] Mark Blythe, Kristina Andersen, Rachel Clarke, and Peter Wright. 2016. Anti-solutionist strategies: Seriously silly design fiction. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 4968–4978.
- [7] Mark Blythe, Enrique Encinas, Jofish Kaye, Miriam Lueck Avery, Rob McCabe, and Kristina Andersen. 2018. Imaginary Design Workbooks: Constructive Criticism and Practical Provocation. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. ACM, New York, NY, USA, Article 233, 12 pages. <https://doi.org/10.1145/3173574.3173807>

- [8] J Boehnert. 2017. Design, Ecology. *Politics: Towards the Ecocene* (2017).
- [9] Hronn Brynjarsdottir, Maria Håkansson, James Pierce, Eric Baumer, Carl DiSalvo, and Phoebe Sengers. 2012. Sustainably unpersuaded: how persuasion narrows our vision of sustainability. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 947–956.
- [10] Janet Davis and Lisa P Nathan. 2015. Value sensitive design: Applications, adaptations, and critiques. In *Handbook of Ethics, Values, and Technological Design*. Springer, 11–40.
- [11] Lynn Dombrowski, Ellie Harmon, and Sarah Fox. 2016. Social justice-oriented interaction design: Outlining key design strategies and commitments. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems*. ACM, 656–671.
- [12] Paul Dourish. 2010. HCI and environmental sustainability: the politics of design and the design of politics. In *Proceedings of the 8th ACM conference on designing interactive systems*. ACM, 1–10.
- [13] Sarah Fox, Mariam Asad, Katherine Lo, Jill P Dimond, Lynn S Dombrowski, and Shaowen Bardzell. 2016. Exploring Social Justice, Design, and HCI. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. ACM, 3293–3300.
- [14] Batya Friedman and WS Bainbridge. 2004. Value sensitive design. (2004).
- [15] Adam Greenfield. 2017. *Radical technologies: The design of everyday life*. Verso Books.
- [16] Barbara Grimpe, Mark Hartswood, and Marina Jirotko. 2014. Towards a closer dialogue between policy and practice: responsible design in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2965–2974.
- [17] Marina Jirotko, Barbara Grimpe, Bernd Stahl, Grace Eden, and Mark Hartswood. 2016. Responsible research and innovation in the digital age. *Commun. ACM* (2016).
- [18] Jaron Lanier. 2010. *You are not a gadget: A manifesto*. Vintage.
- [19] Jen Liu, Daragh Byrne, and Laura Devendorf. 2018. Design for Collaborative Survival: An Inquiry into Human-Fungi Relationships. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, 40.
- [20] MATTER. 2016. *Principles for Responsible Innovation: Building the trustworthiness of innovation*. Technical Report. <http://www.matterforall.org/wp-content/uploads/2016/01/MATTER-Principles-for-Responsible-Innovation-Consultation-Draft-January-2016-.pdf>.
- [21] Richard Owen, Jack Stilgoe, Phil Macnaghten, Mike Gorman, Erik Fisher, and David Guston. 2013. *A Framework for Responsible Innovation*. John Wiley and Sons, 27–50. <https://doi.org/10.1002/9781118551424.ch2>
- [22] Sebastian Prost, Elke Mattheiss, and Manfred Tscheligi. 2015. From awareness to empowerment: Using design fiction to explore paths towards a sustainable energy future. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*. ACM, 1649–1658.
- [23] Andreas Reckwitz. 2002. Toward a theory of social practices: A development in culturalist theorizing. *European journal of social theory* 5, 2 (2002), 243–263.
- [24] Christian Remy, Oliver Bates, Alan Dix, Vanessa Thomas, Mike Hazas, Adrian Friday, and Elaine M Huang. 2018. Evaluation beyond Usability: Validating Sustainable HCI Research. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, 216.
- [25] Elizabeth Shove and Mika Pantzar. 2005. Consumers, producers and practices: Understanding the invention and reinvention of Nordic walking. *Journal of consumer culture* 5, 1 (2005), 43–64.
- [26] Bernd Carsten Stahl, Job Timmermans, and Catherine Flick. 2017. Ethics of Emerging Information and Communication Technologies On the implementation of responsible research and innovation. *Science and Public Policy* 44, 3 (2017), 369–381.
- [27] Jack Stilgoe, Richard Owen, and Phil Macnaghten. 2013. Developing a framework for responsible innovation. *Research Policy* 42, 9 (2013), 1568–1580.